

## REMARKS

Claims 2, and 4-9 are pending in the application.

I. The 35 U.S.C. section 112 rejections and the drawing rejections have respectfully been overcome.

At page 2 of the Office Action, the language in claim 2 means for one of heating and cooling at least one AOTF is stated to not be properly disclosed in the specification and the drawing.

In response, applicant points out that at page 3, lines 24-25 a plate P which is shown in Figure 2 is disclosed as "a plate P which can be heated or cooled electrically." Therefore, applicant believes that one skilled in the art, would be enabled by the structure shown and described. Further, it possible that one skilled in the art could elect to use one of several types of heat sinks or Peltier coolers for example which are well known in the art. For the convenience of the Examiner applicant has attached an information sheet from a supplier of Peltier coolers which are well known in the art and could be used for the cooling means as claimed. Therefore, applicant respectfully asserts that there is no disclosure or enablement problems present for one skilled in the art, and thus the rejections due to 112 issues are respectfully traversed.

Applicant is also amenable to adding a box representation to the Figures of the means for heating and cooling if plate P is deemed insufficient.

II. The cited references respectfully do not teach or suggest the limitations of independent base claim 2 and dependent claims 2, 4-9.

At pages 3-5 of the Office Action, independent base claim 2, and dependent claim 4-9, stand rejected as obvious in view of a combination of four references the Admitted Prior Art, Kemeny and two newly cited references, Nelson, U.S. Pat. 4,787,750 and Fay., U.S. Pat. 5,617,206.

As a preliminary matter it is respectfully asserted that ideally an obviousness rejection under 35 USC 103 is based on one reference or a combination of one or two references. Therefore, when as many as four references are cited the burden of establishing a prima facie case of obviousness under MPEP 706.02(j) becomes much harder in light of MPEP 2143.01 which states that the proposed modification or combination of references cannot require a substantial reconstruction and redesign of the elements as shown in the primary reference in as well as a change in the basic principle under which the primary reference construction was designed to operate.

It is respectfully asserted that in the reasoning of the Office Action the combination of references would change the basic principle under which the various patents function as described in detail below.

In general: the application (LSM) in the references is not comparable to any of the cited reference patents.

The admitted prior art, i.e., the primary reference, discloses a laser scanning microscope with an AOTF.

In Brandt (cited but not relied on), the relationship between temperature and sound velocity in the AOTF crystal is described in the appendix to the original Brandt patent text. However, it is not suggested in Brandt to hold the temperature constant, but rather to change the AOTF frequency based on temperature measurement.

Fay, (column 14) likewise describes a mechanism (measurement of the variation in the index of refraction) by which temperature changes can be determined. The AOTF crystal is detuned (optimizing for other wavelengths) by supplying heat. This is precisely the opposite of the claimed invention claiming temperature regulation at a constant value, and therefore Fay "teaches away" from it.

The combination of AOTF and fiber is the primary disclosure of Kemney (application of AOTF technique in spectrometer). This respectfully has nothing to do with temperature regulation.

Nelson, on the other hand, described temperature stabilization of the AOTF, namely, by heating the crystal. However, the application is for spectrometer in this case again, and not for a laser scanning microscope as claimed.

Also, the rejection admits in item 5 that holding the temperature of an AOTF constant in a laser scanning microscope is not disclosed by the prior art, Kemeny and Fay. Therefore, Nelson must make up for this deficiency and it respectfully does not.

Rather, Nelson relates to the application of spectrometers and no reasoning is provided why one of ordinary skill in the art would be motivated, and why one would achieve a reasonable expectation of success, from the combination as is required by MPEP 706.02(j), to develop the

subject matter of laser scanning microscopy as claimed in claim 2..

Kemney uses an AOTF in a spectrometer. Although a temperature regulation is carried out up to an accuracy of +/- one degree, the AOTF is nevertheless regulated basically with respect to its control frequency on the basis of the temperature sensor (column 13, lines 33ff). Nothing in Kemney points to a laser scanning microscope.

In contrast to Kemney, in an advantageous construction of the invention as claimed in claim 2, the object is to keep the control frequency constant in order to prevent intensity fluctuations in the scanned image. A fast frequency change of this type is also not possible in Kemney due to the pixel times in the microsecond range with the scanning in the LSM.

Thus, it is respectfully submitted that these references are cited together based on hindsight, since the application to a laser scanning microscope is not rendered obvious as required by MPEP 706.02(j) and MPEP 2143.01 because the fundamental function of the primary reference, i.e., the admitted prior art could not function with combined with the three other references as described above.

In contrast, the present invention as claimed is clearly based on the combination of high-precision temperature regulation and LSM application (contained therein is the coupling in a single-mode fiber, but also the special features of the LSM beam path, e.g., the corresponding sensitive detection which requires an accurate regulation), the specific multichannel fluorescence application can also be included, or the recording of time series over several hours in which changes in intensity point to a change in the specimen characteristics or ion concentration measurements, where specific measured values are likewise derived from intensity values; that

is, those applications in general which require a stable coupling in.

III. Given the above reasons a *prima facie* case of obviousness as required for a combination of references under 35 USC 103 and as described in detail at MPEP 706.02(j) has not been established by the reasoning at pages 3-5 of the Office Action

Therefore, the rejection at pages 3 through 5 of the Office Action of claims 2 and 4-9 and respectfully does not meet the standards for establishing a *prima facie* case of obviousness as required by 35 U.S.C. section 103 and as described in detail at MPEP 706.02(j) which is discussed in detail below.

In order to establish a *prima facie* case of obviousness according to section 706.02(j) of the Manual of Patent Examining Procedure (MPEP) the following criteria must be met:

The MPEP Standard for Combining/Modifying References

The Manual of Patent Examining Procedure, section 706.02(j) sets forth the standard for combining and/or modifying prior art, and states:

To establish a *prima facie* case of obviousness, three basic criteria must be met. **First**, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. **Second**, there must be a reasonable expectation of success. **Finally**, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The

teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See MPEP § 2143 - § 2143.03 for decisions pertinent to each of these criteria. [Bold emphasis provided.]

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). See MPEP § 2144 - § 2144.09 for examples of reasoning supporting obviousness rejections.

#### The First Criteria: Motivation to Combine/Modify

The first criteria of the Manual of Patent Examining Procedure, section 706.02(j) requires that the reasoning on pages 3 through 5 of the Office Action point to some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings.

The reasoning at pages 3 through 5 of the Office Action sets forth the teaching of the references: The Admitted Prior Art, Kemeny, Fay, and Nelson in combination and concludes at page 5 that it would have been obvious to one of ordinary skill in the art to "modify the device disclosed by the Prior Art, Kemeny and Nelson such that to keep the temperature constant in order to promote accuracy over a wider range of ambient conditions, as already suggested by Nelson." However as noted above in the individual discussion of each reference, none of the references teach or suggest limitations of independent claims 2 or 9.

In summary of the above, this is because the cited Prior Art and Kemney are admitted not to disclose an cooler structure and also they do not focus on keeping the temperature constant. Therefore, Fay is cited for disclosing a cooler, but Fay, (column 14) likewise describes a mechanism (measurement of the variation in the index of refraction) by which temperature changes can be determined. The AOTF crystal is detuned (optimizing for other wavelengths) by supplying heat. This is precisely the opposite of the claimed invention claiming temperature regulation at a constant value, and therefore Fay "teaches away" from it. Combining Fay also violates MPEP 2143.01 because it is incompatible with the Prior Art and Kemney as described above. Therefore, Nelson must teach a cooler and must teach keeping the temperature constant, and it is only cited for keeping the temperature constant, so as no cooler as claimed and used in the present invention is disclosed, at least the rejection fails to disclose a prima facie case of obviousness as required under 35 USC 102 and MPEP 706.02(j). Also, Nelson is from the non-analogous spectrometer art and therefore does not teach the limitations of

use in laser scanning microscope as required by to teach all the limitations for obviousness as required by 35 USC 103.

Therefore, none of the references teach or suggest all of the limitations of claim 2 or 9 as required by 35 USC 103. Therefore, at this time it, is respectfully asserted that there is no teaching or suggestion on the record of why it would have been obvious at the time of the invention for a person having ordinary skill in the art to view these four references, , and somehow respectfully make the quantum leap to develop the invention as claimed in independent claims 2 or 9 as discussed above. Rather, a hindsight analysis would be required. Therefore, the first criteria of section 706.02(j) of the Manual of Patent Examining Procedure is respectfully not met by the reasoning presented at pages 3 through 5 of the Office Action in regard to independent claims 2 and 9.

#### The Second Criteria: Reasonable Expectation of Success

The second criteria of the Manual of Patent Examining Procedure, section 706.02(j) states that there must be a reasonable expectation of success to incorporate the alleged cooler feature of Fay and the allegedly analogous art of Nelson into the admitted Prior Art and Kemney. However, as it has been noted above, that no actual disclosure, teaching or suggestion of the limitations of independent claims 2 or 9 is taught by any of the four references taken alone or in combination, it is respectfully asserted that no reasonable expectation of success can be based on a teaching that does not exist in the references. Further, one skilled in the art could not expect to have success by combining Fay with opposite teachings of the Prior Art and Lemney. Therefore,



the second criteria of MPEP, section 706.02(j) is also respectfully not met by the reasoning presented of pages 3 through 5 of the Office Action.

The third limitation of MPEP 706.02(j) requires that the prior art references when combined must teach or suggest all the claimed limitations. As discussed above, it is respectfully asserted the specific limitations of independent claims 2 and 9 are not taught or suggested or even disclosed by any of the four references when taken alone or together and are also not compatible.

Therefore, in summary, it is respectfully asserted that the above discussion clearly shows that the criteria for establishing a *prima facie* case of obviousness as required by 35 U.S.C. section 103, and as described in detail at MPEP section 706.02(j), have not been met. Therefore, it is respectfully requested that independent base claims 2 and 9 be reconsidered and allowed.

Claims 4-8 depend from independent base claim 2, and are therefore also believed to be allowable. Thus, reconsideration and allowance of all of the claims is respectfully requested.

#### IV. The prior are made of record and not relied upon

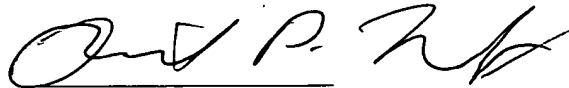
Applicant notes that the other references cited have been reviewed and they are also not believed to disclose, teach or suggest at least the limitations of independent base claims 2 and 9.

#### V. Conclusion

For all the reasons above, it is respectfully asserted that all of the claims are in condition for allowance. Reconsideration and allowance of all the claims is respectfully requested. The

Examiner is invited and encouraged to telephone the undersigned for any reason pertaining to this application.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Daniel P. Lent", written over a horizontal line.

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